LECHSYS

USER HANDBOOK

REVISION N° 7 / 2020

TECHNICAL INFORMATION ON LECHSYS SYSTEM

COMPATIBILITY BETWEEN BASE COLOURS AND BINDERS

By following the **LECHSYS** formulations, recorded in **LECHLER MAP®** and provided with the CD for **PC** and **DATA BOX**, you will never have any compatibility problems between the base colours and the several binders.

Sometimes, for several reasons, it is needed to formulate or correct colour samples.

In these cases, it is recommended to observe the following guidelines concerning the compatibility between base colours and binders.

The colour of this table legend shows the usage of the base colours with the relevant binder:

NO problems for use.

DO NOT USE

29044 – 29046   **must be avoided** in the following binders**:**
29155, 29164 e 29282
and where a considerable weather resistance is required.

29000   29000 **must be avoided** in the following binders:
29180, 29182, 29184, 29185, 29186, 29190:
29000 would cause a shock between the base colours.
Use 29001 and vice versa (29001 can be only used in these binders: with other binders use 29000).

29088   **should be avoided** in the following binders:
29100, 29101, 29102, 29103, 29204, 29105, 29106, 29107, 29108, 29109, 29175, 29180, 29182, 29184, 29185, 29186.
As the ratio between base colour and binder is high there is no particular need for its use.
Do not use at all in low opacity colours.

29016 – 29023   **should be avoided** in the following binders:
29100, 29102, 29107, 29131, 29133, 29134, 29139, 29140, 29142, 29143, 29144, 29146, 29147, 29149, 29152, 29153, 29154, 29155, 29156, 29157, 29158, 29159, 29164, 29170, 29172, 29175, 29176, 29179, 29180, 29182, 29184, 29185, 29186, 29190, 29282, 29299, 29443, 29472,
as they have no solvent resistance or a lower chemical resistance than the binders and the relevant hardeners.

29511   **Military Black:** used in dark colours when a special performance concerning "Heat build – up" is required.

	29000	29001	29007	29010	29013	29015	29016	29018	29023	29024	29025	29031	29038	29044	29046	29048	29049	29054	29059	29062	29068	29072	29081	29085	29088	29093	29094	29097	29098	29511	
29100		■					■		■					■	■															■	29100
29101		■																												■	29101
29102		■					■		■					■	■															■	29102
29103		■																												■	29103
29105		■																												■	29105
29106		■																												■	29106
29107		■					■		■					■	■															■	29107
29108		■																												■	29108
29109		■																												■	29109
29111		■																												■	29111
29112		■																												■	29112
29114		■																												■	29114
29116		■																												■	29116
29117		■																												■	29117
29118		■																												■	29118
29119		■																												■	29119
29120		■																												■	29120
29122		■																												■	29122
29124		■																												■	29124
29125		■																												■	29125
29127		■																												■	29127
29130		■																												■	29130
29131		■					■		■					■	■															■	29131
29132		■																												■	29132
29133		■					■		■					■	■															■	29133
29134		■					■		■					■	■															■	29134
29139		■					■		■																					■	29139
29140		■					■		■																					■	29140
29141		■																												■	29141
29142		■					■		■																					■	29142
29143		■					■		■																					■	29143
29144		■					■		■																					■	29144
29145		■																												■	29145
29146		■					■		■																					■	29146
29147		■					■		■																					■	29147
29149		■					■		■																					■	29149
29150		■																												■	29150
29151		■																												■	29151
29152		■					■		■																					■	29152
29153		■					■		■																					■	29153
29154		■					■		■																					■	29154
29155		■					■		■					■	■															■	29155
29156		■					■		■																					■	29156
29157		■					■		■																					■	29157
29158		■					■		■																					■	29158
29159		■					■		■																					■	29159
29164		■					■		■					■	■															■	29164
29170		■					■		■					■	■															■	29170
29171		■																												■	29171
29172		■					■		■					■	■															■	29172
29173		■																												■	29173
29175		■					■		■					■	■															■	29175
29176		■					■		■					■	■															■	29176

	29000	29001	29007	29010	29013	29015	29016	29018	29023	29024	29025	29031	29038	29044	29046	29048	29049	29054	29059	29062	29068	29072	29081	29085	29088	29093	29094	29097	29098	29511	
29179		R					R		R					R	R															R	29179
29180	R						R		R																R					R	29180
29182	R						R		R																R					R	29182
29184	R						R		R																R					R	29184
29185	R						R		R					R	R															R	29185
29186	R						R		R																R					R	29186
29190	R						R		R																					R	29190
29204		R					R		R																					R	29204
29282		R					R		R					R	R																29282
29299		R					R		R																					R	29299
29424		R					R		R																					R	29424
29443		R					R		R																					R	29443
29472		R					R		R					R	R																29472

POSSIBLE MIXTURE	NOT POSSIBLE MIXTURE
(grey)	(red)

Possible use of some base colours in place of other base colours:

- ❏ 29010 base colour has a similar tone to 29016
  - ○ If you want to obtain a more economical product (with lower colour change resistances) 29010 base colour can be replaced with 29016 base colour (always check the resulting colour).
- ❏ 29025 base colour has a similar tone to 29023
  - ○ If you want to obtain a more economical product (with lower colour change resistances) 29025 base colour can be replaced with 29023 base colour (always check the resulting colour).
- ❏ 29049 base colour has a similar tone to 29046
  - ○ If you want to obtain a more economical product (with lower colour change resistances) 29049 base colour can be replaced with 29046 base colour (always check the resulting colour).
- ❏ 29054 base colour has a similar tone to 29044
  - ○ If you want to obtain a more economical product (with lower colour change resistances) 29054 base colour can be replaced with 29044 base colour (always check the resulting colour).

Vice versa in order to increase the colour stability you can replace the base colours 29016-023-046-044 in the formulation with the base colours 29010-025-049-054.

To manage and obtain colours you must consider that being Lechsys a polyvalent system, it does not guarantee the thorough colour matching of all colours in all binders. Choose the colour to reproduce after checking its colour reference on our colour tools; then, after obtaining the product according to the Lechler MAP® formulation, apply the product, catalysed and thinned as per TDS, until complete coverage has been achieved and compare it when thoroughly dried with the colour reference under optimal light conditions. If necessary, proceed with colour correction. Avoid painting manufactured items without any previous colour check.
As tinters of the Lechsys system are at high concentration, it is recommended to perform mixed colours in minimum quantities no lower than 2 litres and no lower than 4 litres for light colours. After dosing, mix vigorously the obtained mixture, better if with mechanical equipment, and make sure that colour has completely dispersed into the binder used.

HOW TO IMPROVE THE OPACITY OR TO OBTAIN HIGH OPACITY PRODUCTS

All colours obtained through **LECHSYS** System have been formulated to reach opacity by 2 cross coats, except the bright colours of yellow, orange, red-orange range, obtained in lead-free formulation having a lower opacity.

LECHSYS System gives you the possibility of further improving the colour opacity.

Colour opacity can be improved through 2 methods:
 Recommended method

1. Use a primer/filler with the same colour as of the topcoat or a coloured primer/filler with high opacity similar to the topcoat.
    For this refer to the colour chips of the LECHSYS BASE COLOURS fan (see price list code 96953) under item "undercoats".

    Example
    29107 EPOXYPRIMER   formulated in 7777731 undercoat
                                +
    29140 ISOLACK HIGH   formulated in RAL 1023 colour
    This allows you to delete the contrast ratio primer/filler-topcoat and to obtain high opacity cycles.

2. Increase the coloured part with max. 20% (multiply the base colour weight by 1,2 and take off the added base quantity from the binder in the formulation).

EXAMPLE: **RAL 1023 COLOUR IN 29145 ISOLACK PUR**

Base colour	Weight	Correction factor	Higher opacity formulation *Two decimals weight*		Higher opacity formulation *One decimal weight*
29145	791,1		749,32	△	749,3
29016	181,4		217,68		217,7
29000	22,9	1,2	27,48		27,5
29013	4,3		5,16		5,2
29031	0,3		0,36		0,3
	1000,0		1000,00		1000,0

△ Value obtained by taking off the total quantity of base colours from 1000 g.

The new product with higher opacity keeps the same catalysis, the same dilution and the same chemical-physical characteristics as of the standard opacity product.

It is easy to guess the time saving in application above all when paintwork concerns an especially jointed manufactured item as for example a complex industrial machine.

As regards the point 2, considering the approximate values due to the recalculations of the formulas' percentages, it is recommended to verify the effectiveness of the adjustment by a preliminary test prior to modifying the formula.

PRODUCTION RATIONALISATION

In the LECHSYS System rationalised cycles have been conceived, requiring the **same hardeners** and **thinners** for the PRIMER, the FILLER and for the TOPCOAT.
This is an advantage of the system and it is an important topic of the commercial proposal.

Painting process examples:

1) **LS109 (29109)** ACRIPUR PRIMER + **LS155 (29155)** ACRITOP
2) **LS109 (29109)** ACRIPUR PRIMER + **LS105 (29105)** HI-BUILD FILLER + **LS155 (29155)** ACRITOP

This allows you to obtain easy mixtures, to make less catalysis and thinning mistakes and to handle lower stocks in the warehouse.

In the LECHSYS system you have also available **many BINDERS adhering directly to metal or plastic substrate with no need of any primers or bond products**.

Besides rationalising a painting process with less product consumption, these direct adhesion topcoats considerably reduce times and costs painting.

LECHSYS FOR SEMI-GLOSS AND SEMI-MATT ENAMELS

In the most important enamel ranges the **LECHSYS** System always gives a choice between gloss and matt enamel. These binders are mixable with each other in all ratios in order to achieve intermediate gloss levels according to the table here below:

Gloss binder		Matt binder	Semi-gloss 65-75 Gloss	Semi-matt 40-50 Gloss
29116	+	29112	//	1:1
29120	+	29122	1:3	1:4
29132	+	29130	1:3	1:4
29145	+	29141	1:3	1:4
29144	+	29142	1:3	1:4
29143	+	29152	1:3	1:4
29157	+	29158	3:1	1:1
29170	+	29172	1:3	1:4
29180	+	29182	1:3	1:4

When mixing 2 binders with each other to obtain an intermediate gloss level, use the hardener of the binder used at the highest percentage, in the same ratio as expected for this binder.
When using 2 binders in the ratio 1:1, the hardener ratio of one or the other binder can be used, since chemical-physical characteristics do not change.

Example:

Colour from binder	Utilisation ratio	Standard catalysis	Hardener
29144		50	29344
29142		25	29342
29144	2	50	29344
29142	1		
29144	1	25	29342
29142	2		
29144	1	50	29344
29142	1	25	29342

The "virtual" binders allow you to obtain finishes with different gloss levels between **MATT** and **HIGH GLOSS** when combining the matt and gloss binders already available in the Lechsys product range.
These new products are available in all colours in the following product lines:

SYNTOLACK – ISOLACK PUR – ISOLACK – ACRYL 2K – ACRYL 1K – ACRYL 2K TEXTUR.

The virtual binders are available by combining together matt and gloss binders by weight in the following ratios to obtain different gloss levels as indicated in the table below:

	SYNTOLACK	ISOLACK PUR	ISOLACK	ACRYL 2K	ACRYL 1K	ACRYL 2K TEXTURE
MATT 3/7 GLOSS	29112					
SEMI MATT 7/15 GLOSS				29153	29158	29159
SATIN MATT 15/25 GLOSS	29400 29112 75 29116 25			29404 29153 83 29143 17	29407 29158 75 29157 25	29410 29159 67 29143 33
SEMI GLOSSY 30/45 GLOSS	29401 29112 50 29116 50	29141	29142	29405 29153 75 29143 25	29408 29158 50 29157 50	29411 29159 50 29143 50
GLOSSY 50/75 GLOSS		29402 29141 75 29145 25	29403 29142 85 29144 15	29406 29153 50 29143 50	29409 29158 25 29157 75	29412 29159 33 29143 67
HIGH GLOSSY ≥80 gloss	29116	29145	29144	29143	29157	29143

The "virtual" binders are not available as a stock line; they are produced according to the weight mixing formula available in the Lechler SW.
To obtain them you will need to weigh the system binders by multiplying the formula's quantity by the relevant percentage according to the ratios indicated in the product description (see also the table here above).
You can obtain each product formula by means of the SW Lechler MAP® through which you can also obtain not only the formula for each finished product, but also the relevant labels, MSDS, prices and personal formulas.

For the finished products based on the new "virtual" binders there is a TDS with information on the products characteristics, hardener and thinner ratios; these are already available onto the website www.lechler.eu for the products LS112, LS141, LS142, LS153, LS158, LS159 and in the TDS 0389 of the Lechsys System.

When visually evaluating and comparing colours obtained in gloss and in matt by following the same formula, a colour difference can be perceived and can vary according to the colours.
This does not mean that colours are really different, but this is due to an optical distortion engendered by a different eye sensitivity in "reading" the same colour in gloss and matt effect.

It is to consider, moreover, that the final gloss result is only indicative, as it is strongly affected by lots of variables often connected with each other.

TABLE OF GLOSS VARIABLES

AFFECTING FACTORS		OBTAINED EFFECT	
		MATTER	LESS MATT
AIR PRESSURE	HIGH	X	
	LOW		X
HARDENER	SLOW	X	
	FAST		X
THINNER	SLOW	X	
	FAST		X
DRYING TIME	AIR	X	
	LOW BAKE		X
APPLICATION	FLASH-OFF BETWEEN COATS		X
	ONE COAT	X	
FLASH-OFF	LONG		X
	SHORT	X	
FILM THICKNESS	HIGH	X	
	LOW		X
TEMPERATURE CONDITIONS	HIGH	X	
	LOW		X

RAL COLOURS
Information

RAL = German Institute for a quality assurance and identification

RAL 840	=	System's birth (1927) – colours from N° 1 to 40
RAL 840 R	=	Revision – 1939 –1940 division 1 – yellow…9 – black/white
RAL 840 HR	=	Revision of the main list – The colour collection was enlarged (1961) The colour references RAL 840 up to 840 HR were originally matt or semi-matt.

RAL 841 GL =   Gloss colour references – from 1961/1964
Formulated with modern pigments.

The colours formulated in RAL 841 GL and 840 HR, though they have the same name (ex. RAL 1018 Zinkgelb), are visually slightly different as concerns the gloss level.

RAL CLASSIC =   Born in 2013 it joins the colour scales of the version RAL 841 GL and 840 HR

RAL Classic colours, in yellow, orange and red ranges often need a coloured primer/filler to improve their opacity and their coverage.

Undercoats are recommended to ensure a higher opacity of some colours. Undercoats can be recalled in the Lechler MAP® under item "SOTTOTINTE" and are available in the colour fan *Lechsys Base Colours* – code 96953.

The user must check the colour by spraying a sample prior to painting.

INFO:

	COLOUR	RAL RANGE	
		FROM	TO
1	Yellow	1000	1028
2	Orange	2000	2009
3	Red	3000	3027
4	Lilac/Violet	4000	4007
5	Blue	5000	5022
6	Green	6000	6029
7	Grey	7000	7043
8	Brown	8000	8025
9	White, Black, Aluminium	9000	9018

Not all colours for Commercial Vehicles have their colour reference in the MASTER INDUSTRY (e.g. special colours), but their code is available in the CD-ROM of system formulations and in the Lechler MAP®.

Car Manufacturers of Commercial Vehicles often give the RAL reference of the colours used on their production's vehicles.
Nearly always the colour matching to RAL standard is only theoretical.
In these cases it is necessary to refer to the manufacturer's specific colour code or to start from the RAL colour formulation and then correct it.

SUGGESTIONS AND WARNINGS FOR THE CORRECT LECHSYS SYSTEM MANAGEMENT

HOW TO OBTAIN 5 AND 20 KG PACKAGES BY USING THE SAME BINDER TINS:

This system is **only** valid for all enamels.
Weigh the colour for 4-16 litres and add to the binder until you obtain the required 5-20 kg weight.
The binder tin capacity has been conceived to obtain the expected weights.
Opacity will be slightly lowered. As for catalysis and thinning please refer to TDS.

29100 1K FAST PRIMER:
After adding **29000 BIANCO INTENSO** mix thoroughly and immediately with a mixing stick or an automatic shaker to avoid shock and lump formation.

Colours from binders **29101 SYNTOPRIMER ZINC - 29103 SYNTOPRIMER:**
Use recommended thinners or thinners for nitrocombi products, since SYNTOPRIMER products are not compatible with many synthetic competitors' thinners present onto the market.

To the synthetic products **LS112 (29112) SYNTOLACK MATT - LS114 (29114) SYNTOLACK RAPID - LS116 (29116) SYNTOLACK - LS119 (29119) MONOSYNT** it is recommended to add the specific drier **29297 LECHSYS SICCATIVE R** at a rate of 1%.

Colours from binders **29108 EPOPRIMER 1K - 29171 EPOTOP 1K:**
One-pack epoxy-ester products having a slow through-drying especially at low temperatures, due to their chemical nature.
Their use must be suggested only for low film thickness.

Colours from binders **29131 TECNOGRIP METAL - 29133 TECNOGRIP SPARKLING METAL:**
They can be overcoated with clearcoats of any chemical nature due to aesthetical reasons (synthetic, 1K and 2K polyurethane clearcoats, 2K gloss and matt acrylic clearcoats).
At least 24 hours must pass from the application of TECNOGRIP METAL.
The obtained film after the finishing clearcoat will be highly scratch and weather resistant.

Colours from binder **29140 ISOLACK HIGH:**
When painting commercial vehicles (buses, tanks) use 29341 ISOLACK HIGH SLOW HARDENER.

29143 ACRYL 2K:
The only binder can be used as a clearcoat for **visual finishes of metals (catalysis 3:1)**: it has a direct adhesion, but it doesn't resist to yellowing.

The 2K products' **BINDERS** must be normally catalysed. We remind you that **BINDERS** do not contain any UV absorber additives and therefore they tend to yellow outdoors, while they remain unaltered indoors.

It is not recommended to use **MATT BINDERS** as finishing clearcoats since their composition was not conceived to obtain finishing matt clearcoats.

Colours obtained from **EPOXY BINDERS** have some drying limits:
Below +15°C they become slow drying and below +5°C they do not achieve any crosslinking.
Generally **epoxy topcoats** have scarce outside resistance (they tend to bleach, to yellow and to tarnish).

Colours from binder **29116 SYNTOLACK** and generally air drying synthetic enamels can be catalysed when using with 10-20% **29344 LECHSYS ISOLACK HARDENER**.
In most cases this allows you to have
- ❑ Faster drying at low temperature
- ❑ Better through-drying
- ❑ Better outdoor resistance
- ❑ Greater adhesion to the primers

To tint colours (especially white colours) with hardly weighable base colour quantities (example 0,1 g) you can prepare base colours of reduced concentration by following this example:

29081 TB LECHSYS INTENSE BLACK	20 g
29088 TB LECHSYS MIX BASE	80 g

Weigh 0,5 g in place of 0,1 g and obtain the same colour result.
In practice you multiply by 5 the quantity to weigh.

LECHSYS base colours are thick and stable; therefore they must be stirred by mixing machine a few times and for a short time.
It is recommended to stir 1 minute in the morning + 1 minute in the afternoon, when work starts.
Frequent stirring and low consumption make base colours thick, thus impeding at a certain point their dosage and dispersion.
It is advisable to position base colours in the mixing machine only if their consumption is suitable enough to avoid the above-mentioned phenomenon.

In order to produce ANODISED effects of various colours, you can tint the binders **ACRYL 2K (29143-29152-29153-29159)** with BRILLIANT COLORS (max. 10%) to which 5% BC000 U.V. ABSORBER ADDITIVE is to be added to improve their light resistance.
Then they must be applied directly to aluminium or steel to obtain the coloured ANODISED effect.
Please pay attention that by coat overlapping the tone deepens.

EPODUR LS170 (29170) and **LS172 (29172)**, after addition of 09830 GLASS ADHESION PROMOTER, have a fairly good adhesion on glass: however a preliminary test is recommended to test the painting process quality.

It is recommended to immediately mix the base colours with the binder just after weighing the base colours **ESPECIALLY FOR THE BINDERS**

> **29100 1K FAST PRIMER**
> **29143 ACRYL 2K**
> **…….   All nitrocombi binders**

Colours obtained with binder **29139 SOFT:** We suggest and remind that in order to always obtain good results the following cycle must be observed:

1. Apply specific adhesion primer on plastic or epoxy primer on metal.
2. Apply 04111 SOFT PRIMER NERO-AI or 04100 SOFT PROT.INC.SEALER (*04100 Special Product*).
3. Apply **LS139 (29139) SOFT** wet-on-wet in the desired colour.
4. Low bake for 90' at 60°C or 60' at 80°C.

To paint PVC frames and casings you can use colours from the following binders:

- ❑ **29282 FRAMECOAT PVC** when a gloss level of about 50° gloss is needed
- ❑ **29472 FRAMECOAT PVC MATT** when a gloss level of about 30° gloss is needed. The two binders 29282 and 29472 are mixable with each other to obtain intermediate gloss levels.

It is always recommended to carry out a preliminary test as well as to use high resistance pigments.

LS130 (29130) TECNOGRIP in black and derived colours totally absorbing the sun rays (unlike the other colours) becomes thermoplastic (soft) when it is applied to iron and is directly exposed to the sun rays in summer. By temperature falling it achieves its normal consistency.

In the **LECHSYS SYSTEM** it is important to use the suggested thinner to achieve the levels of expected performances. By using non-specific economic thinners you can have poor finishes as for aesthetical aspect, durability and drying.

SPECIAL USES OF PRODUCTS FROM THE LECHSYS SYSTEM

To apply an economical and abrasion resistant paint on interior **concrete floors** of workshops or warehouses you can use colours from the binders **29170-172 EPODUR** after cleaning carefully the surfaces to paint with pressure washers.
Apply the first over-thinned coat as an impregnating coat and the second coat as a normal coat.
Apply by brush or by roller and verify that concrete is compact, in good condition, totally free from humidity when applying and that temperature is above 15°C.

To paint **PVC tarpaulins of commercial vehicles** you can use **LS157 (29157) ACRYL 1K** after previous degreasing and cleaning.
For more valuable finishes you can use a mixture of **29157 ACRYL 1K + 29132 TECNOGRIP GLOSS** in a variable ratio from 4:1 to 2:1 according to the tarpaulin PVC.
A preliminary test is always necessary to verify the film is tack-free after some hours from the application.
(Use **29158+29132** in the same ratios for semi-matt version).

To paint **centre strips** on asphalt you can use colours derived from the binder **29119 MONOSYNT** thinned with synthetic thinner (00570 for roller and brush application or 00572 for spray application).

To obtain a semi-matt, one-coat, very fast drying finish you can mix **1:1 29103 SYNTOPRIMER + 29180 NITRON**.

To apply a **colourless impregnating varnish** on **wood** you can use the only binder **29132 TECNOGRIP GLOSS** without base colours, thinned at 100-200% with 00824.
Apply directly to wood.
It is important to prepare the product already thinned, as no film must be formed and it must be all absorbed by the wood. It doesn't have, of course, either anti-mould properties or protecting properties against woodworms.

As a **Flatting** enamel you can use the pure binder **29118 SYNTOLACK PENN MATT** with addition of 2% **29298 LECHSYS BRUSH SICCATIVE**.

The acid hardener **29385 LECHSYS NITRON 2K HARDENER** can be used as a **degreasing – phosphatising agent for steel sheets** and **aluminium**. After its application clean the surfaces carefully with demineralised water, allow to dry and apply a suitable painting process.

Colours obtained from the binder **29100 1K FAST PRIMER** can be used as a **weldable SHOP PRIMER**.

LECHSYS ISOCYANATE HARDENERS:
USE AND CHARACTERISTICS

CODE	TRADE NAME	HARDENER TYPE AND CHEMICAL CHARACTERISTICS	BINDER PARTNER		CATALYSIS BY VOLUME	THINNER	
			CODE	NAME		TYPE	%
29340	ISOLACK HIGH HARDENER	HIGH QUALITY FOR OUTDOORS	29140 29149 29106 29299	ISOLACK HIGH ISOLACK TEXT. ISOSEALER B/B ISOLACK HIGH EFB	2:1 2:1 2:1 5:1		30-40 30-40 45-50 0-20
29341	ISOLACK HIGH SLOW HARD.	HIGH QUALITY FOR LARGE SURFACES	29106 29140 29149 29154 29299	ISOSEALER B/B ISOLACK HIGH ISOLACK TEXT. ISOLACK ULTRA HS ISOLACK HIGH EFB	2:1 2:1 2:1 2:1 5:1	00825/4	45-50 30-40 30-40 0-15 0-20
29342	ISOLACK ESP HARDENER	ALIPHATIC	29134 29142 29146 29147 29143	TECNOGRIP 2K MET ISOLACK MATT ISOLACK GFR ISOLACK PENN ACRYL 2K	4:1 4:1 4:1 2:1 4:1	00825/4	25-40 25-30 0-30 0-5 0-50
		NON-YELLOWING HIGH QUALITY	29152 29153 29156 29159 29282 29443	ACRYL 2K MATT ACRYL 2K MATT ACRYL 2K GFR ACRYL 2K TEX. FRAMECOAT PVC ACRYL 2K AC	5:1 5.1 5:1 5:1 5:1 5:1	00824	35-40 30-50 0-30 30-35 25-35 10-30
			29139	SOFT	3:1	00673	15-20
29343	ISOLACK ESP INDUSTRY HARDENER	ALIPHATIC AND AROMATIC MIXTURE	29142 29146	ISOLACK MATT ISOLACK GFR	4:1 4:1	00825/4	25-30 0-30
		CHEAP FASTER AND LESS RESISTANT THAN 29342					
29344	ISOLACK HARDENER	ALIPHATIC	29141 29144 29145	ISOLACK PUR MATT ISOLACK ISOLACK PUR	4:1 2:1 4:1	00825/4	25-30 10-15 25-30
		HIGH QUALITY AND NON-YELLOWING					
29345	ISOLACK INDUSTRY HARDENER	ALIPHATIC AND AROMATIC MIXTURE	29141 29144 29145	ISOLACK PUR MATT ISOLACK ISOLACK PUR	4:1 2:1 4:1	00825/4	25-30 10-15 25-30
		CHEAP SLIGHTLY YELLOWING FASTER AND LESS RESISTANT THAN 29344 FOR INDOORS					
29354	ISOLACK UHS STAND.HARD.	GOOD QUALITY	29154	ISOLACK ULTRA HS	2:1	00825/4	0-15
29355	ACRITOP STANDARD HARDENER	ALIPHATIC	29105 29109 29155 29204	HI-BUILD FILLER ACRIPUR PRIMER ACRITOP IS FILLER HBF	5:1 3:1 2:1 4:1	00825/4	5-20 15-25 10-15 15-20
		HIGH QUALITY GENERAL USE FOR POLYURETHANE AND ACRYLIC LACQUERS					
29356	ACRITOP HARDENER FAST	ALIPHATIC	29105 29155 29204	HI-BUILD FILLER ACRITOP IS FILLER HBF	5:1 2:1 4:1	00825/4	5-20 10-15 15-20
		HIGH QUALITY FASTER VERSION THAN 29355					
29357	ACRITOP HARDENER SLOW	ALIPHATIC	29155 29204	ACRITOP IS FILLER HBF	2:1 4:1	00825/4	10-15 15-20
		HIGH QUALITY SLOWER VERSION THAN 29355					
09919	HARDENER	ALIPHATIC	29109	ACRIPUR PRIMER	3:1	00825/4	15-25
		NON-YELLOWING HIGH QUALITY					

CODE	TRADE NAME	HARDENER TYPE AND CHEMICAL CHARACTERISTICS	BINDER PARTNER		CATALYSIS BY VOLUME	THINNER	
			CODE	NAME		TYPE	%
29364	ACRIPROF UHS HARDENER	ALIPHATIC	29164	ACRIPROF UHS	2:1	00825/4	5-15
29397	ACRITOP ULTRA HS FAST HARDENER	FOR TRADITIONAL USE					
29316	ACRIPROF UHS HARDENER AIRLESS	ALIPHATIC / FOR SPECIFIC USE IN AIRLESS			2:1	00653	0-15

LECHSYS AMINIC HARDENERS: USE AND CHARACTERISTICS

CODE	TRADE NAME	HARDENER TYPE AND CHEMICAL CHARACTERISTICS	BINDER PARTNER		CATALYSIS BY VOLUME	THINNER	
			CODE	NAME		TYPE	%
29302	EPOBUILD PRIMER HARDENER	POLYAMIDE / ----------	29102	EPOBUILD PRIMER 2K	2:1	00516	0-10
29370	EPOXYPRIMER STANDARD HARDENER	POLYAMIDE / FOR LARGE SURFACES OR FOR HIGH TEMPERATURES	29107	EPOXYPRIMER	2:1	00516	0-10
29371	EPOXYPRIMER FAST HARDENER	POLYAMIDE / FAST FOR SMALL SURFACES OR FOR LOW TEMPERATURES					
29376	EPODUR HARDENER	POLYAMIDE ADDUCT / HIGH QUALITY	29170 29172 29176	EPODUR EPODUR MATT EPODUR EFB	5:1 5:1 3:1	00516	20-25 40-50 0-20
29377	EPODUR FAST HARDENER	POLYAMIDE ADDUCT / FAST DRYING, HIGH QUALITY					
29379	EPOXYLACK HARDENER	POLYAMIDE / FAST DRYING	29179	EPOXYLACK EFFEKT	3:1	00516	0-20

LECHSYS ACID HARDENERS: USE AND CHARACTERISTICS

CODE	TRADE NAME	HARDENER TYPE AND CHEMICAL CHARACTERISTICS	BINDER PARTNER		CATALYSIS BY VOLUME	THINNER	
			CODE	NAME		TYPE	%
29385	NITRON 2K HARDENER	ACID HARDENER / ----------	29185	NITRON 2 K	2:1	00825	10-20

BRIAR ROOT EFFECT PAINTING PROCESS

BROWN BRIAR ROOT CYCLE WITH LECHSYS PRODUCTS

- Apply **ISOLACK ENAMEL** in RAL 1018 or similar colours on the substrate to paint with briar root effect.

- Allow to dry, then sand dry with grit paper P400 or wet with grit paper P800-1000. Rub down slightly with Ultra Fine Scotch Brite

- Prepare the following mixture (**Lechsys Mix Briar Root**)

  - 29038 TB LECHSYS DARK OXIDE RED   20 parts
  - 29081 TB LECHSYS INTENSE BLACK   5 parts
  - 29190 BASECOAT   75 parts
  - 00825 LECHSYS UNIVERSAL STANDARD THINNER   50 parts

To obtain other darker or less dark colours change the mixing ratio of LECHSYS base colours.

- Degrease the substrate with **00695 SILICONE REMOVER SLOW**

- Apply the coloured mixture **with a sponge or with a lint-free cloth** in **irregular way**.
- Allow to flash off for 5-10' at 20°C.

- Stipple with a clean cloth wet with **00744 FADE-OUT BLENDER** (the cloth must be just wet not dripping). **Since the quantity and the application of 00744 on the surface affect the effect, it is important to optimise this operation**.

- Allow to flash-off for at least 20' at 20°C.

- Spray the following mixture in light coats:

  - 29155 ACRITOP (Binder)   975   parts
  - 29038 TB LECHSYS DARK OXIDE RED   20   parts
  - 29081 TB LECHSYS INTENSE BLACK   5   parts
  - 29355 (Standard)/356 (Fast)
    LECHSYS ACRITOP HARDENER   500   parts
  - 00825 LECHSYS UNIVERSAL STANDARD THINNER   150   parts

- Allow to dry for 20-30' at 60°C.

- To obtain a high quality finish sand dry with P400 grit paper or sand wet with P1000 grit paper, degrease with 00695 SILICONE REMOVER SLOW and overcoat with a glossy or matt clearcoat *.
  * Any two-pack car refinishing clearcoat can be used.

In order to obtain a briar root effect with other colours use a lighter ground coat than the finishing coat. E.g. pink ground coat and wine-red finish or light blue ground coat and dark blue finish.

MARBLE EFFECT PAINTING PROCESS

Apply on the substrate a primer/filler or a two-pack enamel in the desired colour.
Allow to dry and sand dry with P400 grit paper or wet with P800 grit paper.

Prepare the following mixture:

29180 NITRON (only the binder)	99 parts
LECHSYS base colour mixture	1 part
00744 FADE-OUT BLENDER	150 parts

Spray two coats in an irregular way.

Stipple immediately and in a random way with creased industrial paper.
Allow to flash off for about 10'.
Apply thin and uniform coats of the previous colour until you obtain the desired colour.

Allow to flash off for about 10-15'.
Apply 1-2 coats of two-pack gloss or matt clearcoat.
Allow to dry for 30-40' at 60°C.

Example to obtain GLOSS ROSY MARBLE EFFECT

Apply a primer/filler or a two-pack enamel RAL 9010.

Allow to dry

Dry sanding with P400 grit paper

Prepare the following mixture:

29180 NITRON (binder)	99 parts
29054 TB LECHSYS AMARANTH	1 part
00744 FADE-OUT BLENDER	150 parts

Apply two irregular coats

Stipple immediately with creased industrial paper.
Allow to flash off for about 10'
Apply 1-2 coats of the previous mixture until you obtain the desired effect.

Allow to flash off for about 10-15'
Apply two coats of gloss clearcoat 09792 MACROFAN HS 2000
Allow to dry for 30-40' at 60°C.

TECHNICAL INSTRUCTIONS ON PRE-TREATMENT OF PLASTIC SUBSTRATES PRIOR TO PAINTING

SUBSTRATE	ESSENTIAL PREPARATION	MAXIMUM LEVEL PREPARATION
ABS	DEGREASING WITH 00617 PLASTIC CLEANER. DRYING.	DEGREASING BY SPRAY SYSTEMS WITH ALKALINE SURFACE-ACTIVE AGENTS OR ACID SURFACE-ACTIVE AGENTS. RINSE WITH DEMINERALISED WATER. DRYING.
PC/ABS		
PC		
PP	DEGREASING WITH 00617 PLASTIC CLEANER. DRYING. FLAME TREATMENT WITH OXIDISING FLAME. (WETTABILITY 48/52 DM/CM MINIMUM)	DEGREASING BY SPRAY SYSTEMS WITH ALKALINE SURFACE-ACTIVE AGENTS OR ACID SURFACE-ACTIVE AGENTS. RINSE WITH DEMINERALISED WATER. DRYING. FLAME TREATMENT WITH OXIDISING FLAME. WETTABILITY 48/52 DM/CM MINIMUM
POLYOLEFIN RUBBERS	DEGREASING WITH 00617 PLASTIC CLEANER. DRYING.	DEGREASING BY SPRAY SYSTEMS WITH ALKALINE SURFACE-ACTIVE AGENTS OR ACID SURFACE-ACTIVE AGENTS. RINSE WITH DEMINERALISED WATER. DRYING.
RIGID POLYSTYRENE		
SEMI-FOAM POLYSTYRENE		
SOFT PVC		
RIGID PVC		
SOFT FOAM POLYURETHANE	//	DEGREASING IN CHLORINATED SOLVENT VAPOURS
RIGID FOAM POLYURETHANE		
POLYURETHANE R/RIM	//	DEGREASING IN CHLORINATED SOLVENT VAPOURS OR DEGREASING IN WATER WITH ACID SURFACE-ACTIVE AGENTS (5 STAGE SYSTEMS). FOLLOWING DRYING.
POLIUREA		
NYLON	DEGREASING WITH 00617 PLASTIC CLEANER. DRYING.	DEGREASING BY SPRAY SYSTEMS WITH ALKALINE SURFACE-ACTIVE AGENTS OR ACID SURFACE-ACTIVE AGENTS. RINSE WITH DEMINERALISED WATER. DRYING.
FIBREGLASS	SANDING, DEGREASING BY HAND WITH 00617 PLASTIC CLEANER OR WITH CLEANING NITRO THINNER . DRYING WITH DRY CLOTH.	SANDING CLEANING IN HOT WATER WITH SURFACE-ACTIVE AGENTS (WATER SYSTEM OR HIGH PRESSURE JET CLEANERS) RINSE AND DRYING.

<table>
<thead>
<tr>
<td colspan="3" align="center">TECHNICAL INSTRUCTIONS
PRE-TREATMENT OF METALLIC SUBSTRATES AND THE LIKE PRIOR TO PAINTING</td>
<td align="center">R&D Lab COATINGS</td>
</tr>
</thead>
</table>

SUBSTRATES	ESSENTIAL PRE-TREATMENT	MAXIMUM LEVEL PRE-TREATMENT	SUBSTRATES	ESSENTIAL PRE-TREATMENT	MAXIMUM LEVEL PRE-TREATMENT
Cold-Rolled carbon steel Low thickness Without corrosion	1) Phospho-degreasing with high pressure jet cleaners •Rinsing with demineralised water •Drying 2) Degreasing with 00695 SILICONE REMOVER SLOW •Drying	•Degreasing with 00695 SILICONE REMOVER SLOW •Drying •Sanding or orbital sander •Degreasing with 00695 SILICONE REMOVER SLOW •Drying	**Hot Dip Galvanized steel**		•Degreasing with 00695 SILICONE REMOVER SLOW •Drying •Sanding or slight sanding with Scotch Brite •Degreasing with 00695 SILICONE REMOVER SLOW •Drying
Cold-Rolled carbon steel Low thickness With corrosion	•Degreasing with 00695 SILICONE REMOVER SLOW •Drying •Sanding or orbital sander •Degreasing with 00695 SILICONE REMOVER SLOW •Drying	•Degreasing with 00695 SILICONE REMOVER SLOW •Sandblasting to bare metal •Blowing	**Stainless steel**		•Degreasing with 00695 SILICONE REMOVER SLOW •Drying •Sanding or orbital sander •Degreasing with 00695 SILICONE REMOVER SLOW •Drying
Black Hot-Rolled carbon steel High thickness Without black oxide	•Phospho-degreasing with high pressure jet cleaners •Rinsing with demineralised water •Drying	•Degreasing with 00695 SILICONE REMOVER SLOW •Drying •Sanding or orbital sander •Degreasing with 00695 SILICONE REMOVER SLOW •Drying	**Light alloys**	•Degreasing with 00695 SILICONE REMOVER SLOW •Drying •Slight sanding with red Scotch Brite •Degreasing with 00695 SILICONE REMOVER SLOW •Drying	**1)** Degreasing with 00695 SILICONE REMOVER SLOW + Pickling + Chemical conversion: •Chromating or phospho-chromating process or •Non-fixed anodising or •Alternative pre-treatments Notes: After chemical conversion, in order to obtain the best results, paint application must be carried out within 16 hours; max. drying temperature must be between 65°C (chromating process) and 80°C (phospho-chromating and anodising process) **2)** •Degreasing with 00695 SILICONE REMOVER SLOW •Sandblasting with calibrated non-metallic tools •Blowing

Black Hot-Rolled carbon steel High thickness With black oxide		•Degreasing with 00695 SILICONE REMOVER SLOW •Sandblasting to bare metal •Blowing	**PRFG**		•Sanding •Degreasing with 00695 SILICONE REMOVER SLOW •Drying
Pre-coated steel (**E**lectrophoretic **D**eposition)		•Degreasing with 00695 SILICONE REMOVER SLOW •Slight sanding with Scotch Brite •Degreasing with 00695 SILICONE REMOVER SLOW •Drying	**Old solvent resistant coatings**		•Degreasing with 00695 SILICONE REMOVER SLOW •Sanding or slight sanding with Scotch Brite U.F. •Degreasing with 00695 SILICONE REMOVER SLOW •Drying
Electro Galvanized steel		•Degreasing with 00695 SILICONE REMOVER SLOW •Drying			

29088 TB LECHSYS MIX BASE

Among LECHSYS base colours there is also a resin 29088 TB LECHSYS MIX BASE aiming at replacing some high opacity base colours (e.g. grey, beige and brown): it keeps the same ratio between BINDERS and BASE COLOURS and reduces the final product costs.

TABLE OF CONDUCTIVITY VALUES FOR ES APPLICATION

Product	Hardener	Thinner	Siccative	Res SAMES
LS101 (29101)	/	20% 00825		45 MΩcm
LS102 (29102)	30% 29302	5% 00516		8 MΩcm
LS103 (29103)	/	30% 00825		15 MΩcm
LS105 (29105)	13% 29355	17,5% 00825	/	45 MΩcm
LS106 (29106)	25% 29340	25% 00825		4 MΩcm
LS107 (29107)	30% 29370	2,5% 00516		7,5 MΩcm
LS109 (29109)	20% 29355	17,5% 00825		400 MΩcm
LS111 (29111)		15% 00572	1% 29298	90 MΩcm
LS112 (29112)		20% 00825	1% 29298	210 MΩcm
LS114 (29114)	/	17,5% 00825	1% 29297	19 MΩcm
LS116 (29116)		17,5% 00825	1% 29297	300 MΩcm
LS119 (29119)		17,5% 00825	1% 29297	89 MΩcm
LS140 (29140)	50% 29340	35% 00825		15 MΩcm
LS141 (29141)	25% 29344	27,5% 00825		30 MΩcm
LS142 (29142)	25% 29342	27,5% 00825		13 MΩcm
LS143 (29143)	25% 29342	40% 00825	/	17 MΩcm
LS144 (29144)	50% 29344	12,5% 00825		45 MΩcm
LS145 (29145)	25% 29344	15% 00825		90 MΩcm
LS146 (29146)	25% 29342	15% 00825		13 MΩcm
LS149 (29149)	50% 29342	2,5% 00755		4 MΩcm
LS150 (29150)	/	20% 00825	2% 29297	125 MΩcm
LS152 (29152)	20% 29342	37,5% 00825		50 MΩcm
LS153 (29153)	20% 29342	37,5% 00825		30 MΩcm
LS154 (29154)	50% 29354	7,5% 00825		65 MΩcm
LS155 (29155)	50% 29355	12,5% 00825		68 MΩcm
LS156 (29156)	15% 29342	0-25% 00825	/	40MΩcm
LS159 (29159)	20% 29342	30-35% 00825		50 MΩcm
LS170 (29170)	20% 29376	20-25% 00516		4 MΩcm
LS172 (29172)	15% 29376	40-45% 00516		4 MΩcm
LS176 (29176)	20% 29376	0-10% 00516		11 MΩcm
LS179 (29179)	25% 29379	0-15% 00516		28 MΩcm

Tests have been carried out on **grey colour RAL 7040**.

The thinner quantity has been calculated on an intermediate value out of the values indicated on the technical data sheet.

LECHSYS PRODUCTS SUITABLE FOR AIRLESS / AIRMIX APPLICATION

LS109 (29109) ACRIPUR PRIMER

LS107 (29107) EPOXYPRIMER

LS164 (29164) ACRIPROF UHS

LS140 (29140) ISOLACK HIGH

LS141 (29141) ISOLACK PUR MATT

LS142 (29142) ISOLACK MATT

LS144 (29144) ISOLACK (ONLY AIRMIX)

LS145 (29145) ISOLACK PUR (ONLY AIRMIX)

LS154 (29154) ISOLACK HS

LS155 (29155) ACRITOP

LS164 (29164) ACRIPROF UHS